SNTEK

Change for the Better

IN-LINE SPUTTERING SYSTEM

G2 Touch Screen Panel
Thin Film Solar Cell

G2 TSP IN-LINE SPUTTERING SYSTEM

In-Line Sputtering System of SNTEK Co., Ltd. Is qualified equipment that can be solution to economic feasibility and productivity during G2 process. We have got qualified transfer system knowhow that for the manufacturing G2 cell type Jig and large size substrate. It is making that possible to ensure the economic viability and quality of the final production, through design of process chamber from customer's requirement.

ADVANTAGE

- Refractometer process optimized for optical characteristics
- Target efficiency maximization through optimal simulation(>70%)
- Provide high reliability and stability through low particle process
- Easy manipulability and high utilization rate (>85%)
- Excellent deposition rate
- Implementation of automatic process control for whole process by using PLC-based PC

Cathode Technology

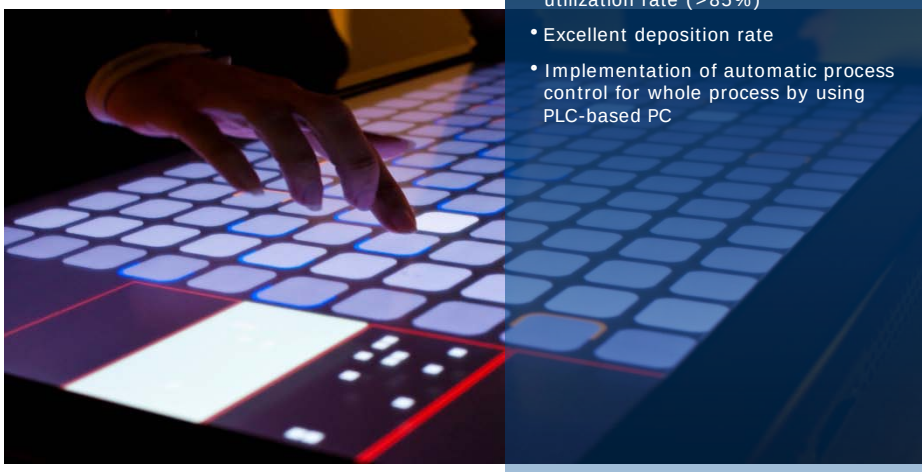
- High efficiency of sputtering cathode
- Target efficiency : more than 70%
- Reduce target cost, Increase uptime

Plasma Technology

- Low damage sputter technology
- Low Temp & High density sputter technology

Manufacturing Technology

- Simulation technology
- Schematic cathode design
- Transfrom simulation



Data Sheet

ITEM	DESCRIPTION		
Material	ITO	Mo, Al, Mo	Nb_2O_5, SiO_2, ITO
Glass Size	~ 1100 x 1300mm	~ 1100 x 1300mm	~ 1100 x 1300mm
Glass Thickness	≤0.5mm	≤0.5mm	≤0.5mm
Thickness Uniformity	≤±5%	≤±5%	≤±5%
Optical Transmittance	>90%(@550nm)		>90%(@550nm)
Sheet Resistance	≤100Ω/sq. (@250Å,ITO)	≤0.4 Ω/sq.	≤150 Ω/sq. (@250Å,ITO)
Beetween ITO Pattern			△T< 1% (@ 550nm)

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SOLAR CELL IN-LINE SPUTTERING SYSTEM

Application to the deposition of optical absorption layer and transparent electrode, rear electrode SNTEK In-Line Sputter used in deposition process of optical absorption layer and transparent electrode, the rear electrode, etc. for the manufacturing of high-efficiency large-area solar cell provides optimized equipment operation and process solution. We have developed and currently hold sufficient process know-how for the production of solar cell by utilizing self-built 5Gen Pilot In-Line Sputter equipment, and secured availability of simple maintenance through simple system configuration and operation.

ADVANTAGE

- High-Temperature process possible(>250℃)
- Target efficiency maximization through optimal simulation(>70%)
- Provide high reliability and stability through low particle process
- Easy manipulability and high utilization rate (>85%)
- Excellent deposition rate
- Implementation of automatic process control for whole process by using PLC-based PC

Data Sheet

ITEM	DESCRIPTION		
Material	ITO	AZO	GZO
Effective Coating Area	~ 1100 x 1300mm	~ 1100 x 1300mm	~ 1100 x 1300mm
Glass Thickness	>2mm	>2mm	2>mm
Thickness Uniformity	≤±5%	≤±5%	≤±5%
Sheet Resistance of TCO	15Ω/sq at 1000nmThick (Resistivity:<1.6XE-4Ωcm)	5.7Ω/sq at 1000nmThick (Resistivity:<5.6XE-4Ωcm)	5.3Ω/sq at 1000nmThick (Resistivity:<5.8XE-4Ωcm)

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LED CHIP EQUIPMENTS

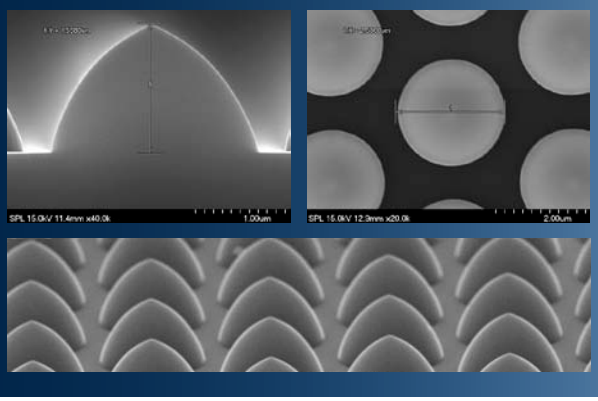
ICP-ETCHER

ICP-ETCHER for PSS

SNTEK's ICP-Etcher provides a solution optimized for user purpose

- Excellent equipment performance and high production yield
- Reliable and stable technological service
- High equipment utilization rate and reasonable cost
- Custom design optimized for business purpose

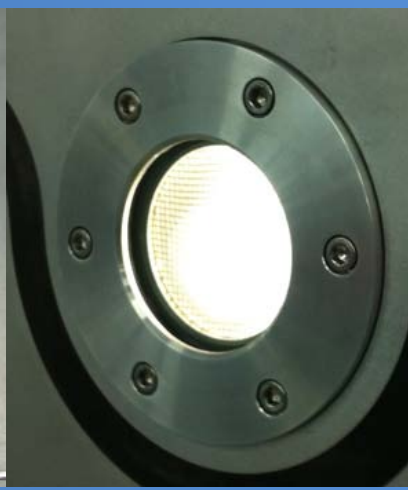
"LED Chip manufacturing equipment using plasma technology and abundant experience"



Specification

ITEM	DESCRIPTION
Application	PSS & GaN Etching
Process Capacity	2"(32pcs) wafer, 4"(9pcs) wafer
Plasma Source	Planar ICP Type
RF Power Supply	Source (3kw), Bias (1kw)
Cooling & Chucking	Backside He
Etching Uniformity	≤±5% (WIW,WTW,RTR)

ITEM	DESCRIPTION	
Etching Rate	PSS	≥65nm/min
	GaN	≥120nm/min
1 Batch Tact	PSS	39min (@1.5㎛-deep etch)
	GaN	24min (@1㎛-deep etch)



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E-BEAM EVAPORATOR

ITEM	DESCRIPTION
Dome Type	Lift-Off Type for Metal
	Planetary Type for ITO
Process Capacity	ITO (2" Wafer 108ea)
	Metal (2" Wafer 76ea)
Evaporation Source	E-Beam (4~6 Pockets,40cc)
ITO Heating Temp	Max. 300℃ on Wafer
Thickness Uniformity	≤±5% (WIW,WTW,RTR)

PE-CVD

ITEM	DESCRIPTION
Application	SiO_2 Deposition
Process Capacity	2" Wafer 32ea
Plasma Source	Planar CCP Type
Source Power	RF 1kW, 13.56MHz
Substrate Temp	400℃
Temp Uniformity	≤±5%
Thickness Uniformity	≤±5%

ASHER

ITEM	DESCRIPTION
Application	PR Removal
Process Capacity	2" Wafer 36ea
Plasma Source	PE Plasma Type
Source Power	RF 1kW
Additional RIE Function for Deep Etching	

RTP

ITEM	DESCRIPTION
Process Capacity	2" Wafer 16ea
Temperature	Max 1000℃ on Wafer
Process Temp	400 ~ 700℃
Heating Uniformity	≤±5%
Ramping Rate	1 ~ 50℃ / sec
Temp Detector	T/C Optical Pyrometer

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R&D APPLIED EQUIPMENTS

Magnetron Sputtering System

Sputtering is used extensively in the semiconductor industry to deposit thin films of various metal and oxide materials. Thin anti-reflection coatings on glass for optical applications are also deposited by sputtering. Because of the low substrate temperatures used, sputtering is an ideal method to deposit contact metals for thin-film transistors. MSS4000 is optimization equipment for R&D.

Metal & Oxide Coating
- Pt, Ti, Cu, Al and other metals
- ZnO, AZO, GZO, TiO2, SiO2,etc

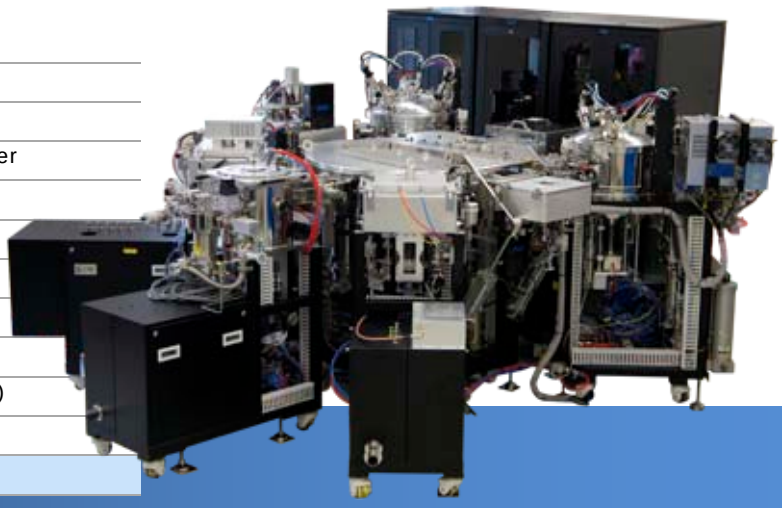
SPECIFICATION

Sample Size	4 inch ~ (Optional)
Gun Type	Up or Down
Film Thickness Uniformity	<±5%
Heating Temp on Substrate	Max 600℃
Heating Uniformity	<±5%
Substrate Rotation	5~20 rpm
Z-motion Unit	50~100mm Target to Substrate Distance
DC Power Supply	1kW, 13.56 MHz
RF Power Supply	600W
Target mount enable	RF 1ea, DC 2ea
LoadLock System	Optional
Full Auto Control Using PC or PLC (Touch)	

Cluster Sputtering System

Sputtering is used extensively in the semiconductor industry to deposit thin films of various metal and oxide materials. Thin anti-reflection coatings on glass for optical applications are also deposited by sputtering. Because of the low substrate temperatures used, sputtering is an ideal method to deposit contact metals for thin-film transistors. MSS4000 is optimization equipment for R&D.

Metal & Oxide Coating
Multi Layer Coating
MEMS Application
ETC



SPECIFICATION

Sample Size	4 inch ~ (Optional)
Process Chamber	3 Set
Vacuum pumping system	Rotary + TMP, Etch Process Chamber
Magnetron sputter source	16 inch Sputter Gun x 3ea
Sample Rotation	Rotation Only
Sample Heating Source	Circular 12.5inch
Thermo couple, Pyrometer	1set
Gas Supply System	Ar,O2 x 3set
Power Supply	DC, Pulsed DC or RF power (Option)
Film Uniformity	<±5% for WIW, WTW, RTR
Full Automation Control System using PC Interface	

In-Line Sputtering System

n-Line Sputtering System is comprised of several chambers; Wafer Loading Stage, Load Lock, Trans Module, Buffer, 3 Process Chamber.

Electronic Components
Flat Panel Display
Solar Cell

SPECIFICATION

Sharp	Batch, Horizontal ,Vertical Type
Substrate Size	125 x 125 ~ 156 x 156mm
Heat source	Halogen Lamp & Plate Heater
Sputter Gun	Dual Magnetron Sputtering Source
Sputter Power	Pulse DC 20 kW + RF 5 kW
Temp. range	<200℃ in Process Chamber
Heat Uniformity	<±15 ℃
ITO Film Uniformity	<±5% except the Edge 5㎜ of Each sample
Sheet Resistance	50 Ω/sq at 80nm ITO film thickness
Transmittance on glass	More than 85% at 450nm to 1200nm

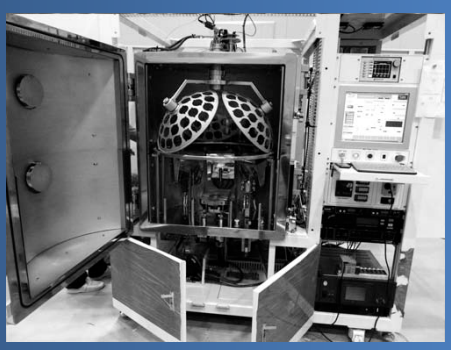
Thermal & E-Beam Evaporator

Our evaporation system may be easily adapted for a variety of leading edge research fields including organic light emitting diodes (OLED), flat panel displays, solar panels, photovoltaics, nanotechnology, materials science, thin film battery metallization and much more.

Metal & Oxide Coating
- Various Metal (Al,Ni,Ti,etc) & Oxide

SPECIFICATION

Sample Size	4inch ~
Power Supply	Thermal & E-Beam Source
Thermal AC Power Supply	10V, 300A(Tungsten Boats) Power Capacity
Electon Gun Assembly	4 Pocket of 4cc Crucible
	Source 270 Deflection
	X-Y Sweep
	Input Power : 220VAC/3 Ø, 60㎐, 40A
	Maximum Power : 6kW
Multi Film Rate	Thickness Monitor
Film Thickness Uniformity	< ±5 %
Heating Temp on Substrate	Max 700℃
Ultimate Pressure	$<5\times10^{-6}$ Torr within 30 min



PE-CVD System

Plasma Enhanced Chemical Vapor Deposition (PECVD) is a process used to deposit thin films from a gas state (vapor) to a solid state on some substrate. There are some chemical reactions involved in the process which occur after creation of a plasma of the reacting gases.

SiOx, SixNy, a-Si etc.
Passivation, isolation

SPECIFICATION

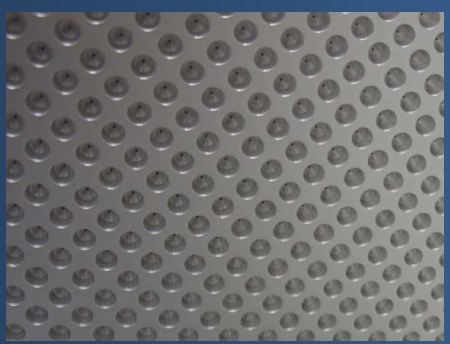
Sample Size	6inch ~
Max. Temperature	700℃ on Heater
Substrate to Gas nozzle Distance	30mm ~ 100mm adjustable(Manual)
Power Source	RF 13.56 ㎒
Gas Flow System	Flow Control Range : 0~100 sccm
	Gas : SiH4,NH3,N2O,Ar,O2 CHF3(for Cleaning)
Gas Scrubber	
Film Thickness Uniformity	Within wafer : <± 5 % within 6 ㎒ wafer
	Run to Run : <± 5 %
Ultimate Pressure	< 1×10-5 Torr within 10 min

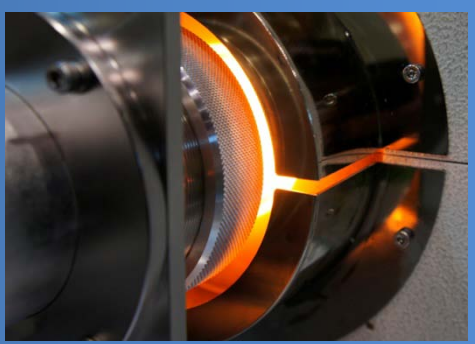
Thermal CVD System

The thermal CVD rig is primarily used for the aluminising of gas turbine materials but is also used for research into chromising, siliconising, reactive element deposition and codeposition CVD processes.

SPECIFICATION

Substrate Size	~ 6inch
Deposition Direction	Downward
Process Gas	Any of requested Gas
Process Temperature	~ 1000℃ on Substrate
Uniformity	<± 3 %
Heating Uniformity	<± 3 %
Full Automation Control	
Load Lock System	





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Asher, RIE System

Reactive Etching(RIE) is an etching technology used in microfabrication. It uses chemically reactive plasma to remove material deposited on wafers. High-energy ions from the plasma attack the wafer surface and react with it.

Silicon etching
Dielectrics etching (SiO2, Si3N4, etc)
Polymide etching

SPECIFICATION

Substrate Size	6inch~
Max. Temperature	700℃ (on heater)
RF Power Supply	13.56MHz, 600W
Gas Flow System	Flow Control Range (0~100 sccm)
	Gas (Ar, O2, SF6, CHF3 / 4 Channel+Option)
	Gas Pannel in Jungle Box
Ultimate Pressure	<1 x 10^{-6} Torr within 10min

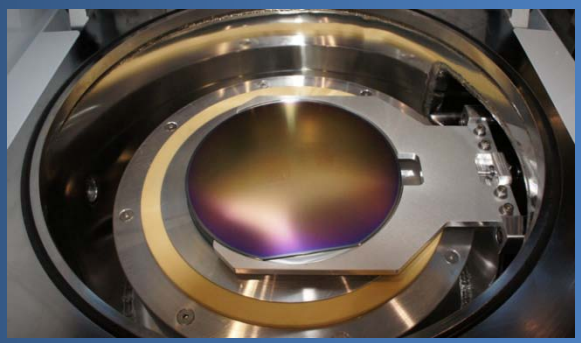
ICP-RIE System

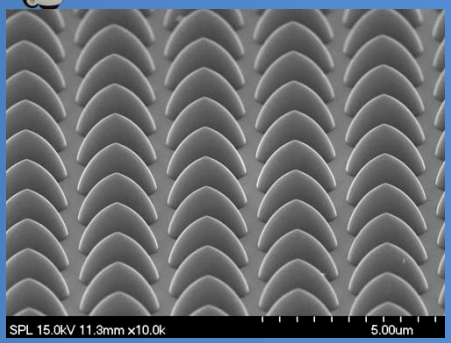
Inductively coupled plasma (ICP) reactive ion etch is a silicon etching process using plasma. It provides good anisotropic etching on silicon. It is also one of the major techniques to build some devices such as micro-sensors and micro-actuators where high-aspect ratio etching process is required. Moreover, a smooth sidewall etching process is a key technology for manufacturing micro-optical MEMS and precise molding.

Metal Etching
Al2O3, Si, SiO2, Si3N4 Etching
Ashing Process, MEMS Process, PSS,GaN etc

SPECIFICATION

Plasma Source	Specially Designed Antenna Module for High Density Plasma
Sample Size	6”Wafer ~
Source(ICP) Power	RF 1000W
Bias Power	RF 600W
High Vacuum Pumping System	TMP + Mechanical Rotary Pump
Sample Loading Unloading	Vacuum Load-Lock System
Plasma Density	>5x10^{-11} /cm^3
Ultimate Pressure	<5x10^{-6} Torr within 1 hour
Etching Uniformity	<±5%





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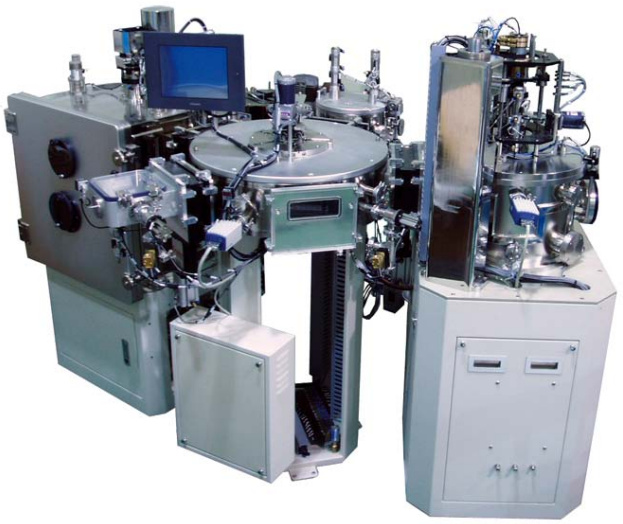
OLED System

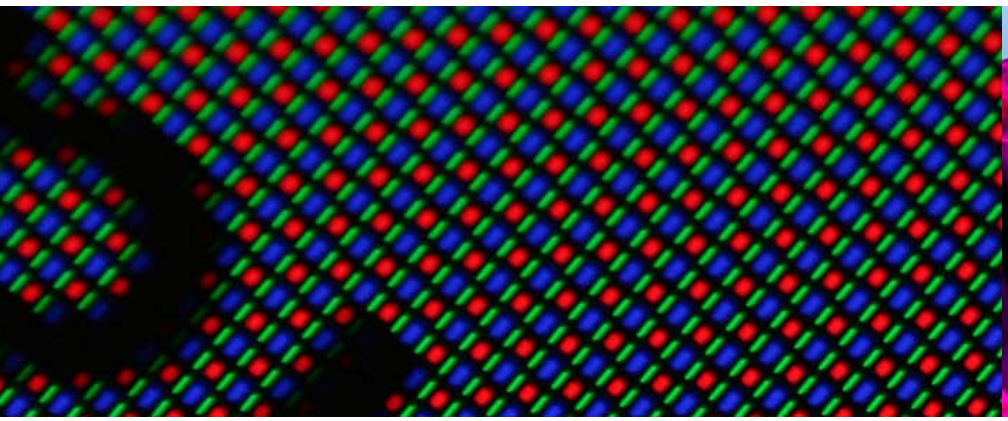
Consisting of Evaportor, Sputter, Parylene, Glove Box. LoadLock

PMOLED,AMOLED on Glass & Wafer
Mono, Area, Full Color Lighting

SPECIFICATION

Sample Size	4inch ~(Optional)
Tact Time	20~80min Depends in the number of mask
Loading Capacity	Glass 1sheet. Mask 4Sheet
Transfer Method	Vacuum Robot
Vacuum Performance	Deposition <2E-7 Torr
Plasma Treatment	Optional
Alignment accuracy	Mechanical less than ±50um
Evaporation source for organic	5ea, 10cc for host,4cc for dopant
Evaporation source for metal	2ea Thermal source, E-Beam is optional
Deposition Uniformity	Organic, Metal, Sputter less than ±3%
Max.Deposition Rate	Organic 5A/sec, Metal 10A/sec
Rate Accuracy	Organic ±5%, Metal ±7%
Thickness reliability	Organic & Metal ±5% glass to glass
Doping ratio	Less than 1% at 1A/sec of host
Conductive Oxide	Low Damage Sputtering (FTS or general Sputter)
Thin Film Passivation	Parylene coating & inoirganic coating
Glove Box	H2O, O2, less than 0.1ppm
Full automation system (Option)	

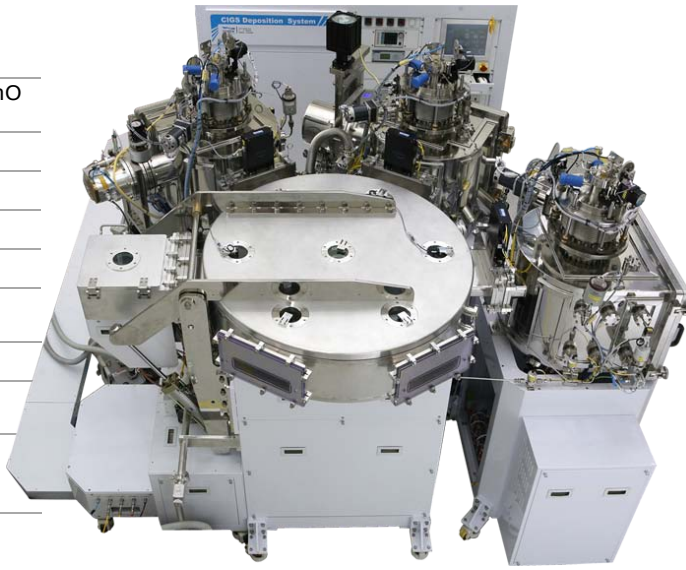




CIGS Solar Cell System

CIGS Solar Cell System as R&D Equipment for compound thin film solar cell is consist of transfer, LoadLock, MBE, back contact Sputtering and window Sputtering Chambers. In CIGS series process Mo-back contact was deposited on sodalime glass by sputtering system and the CIGS absorber layer over the Mo back contact growth technique using multi-source(CU,In,Ga,Se) evaporation method.Then Window layer consisted of ZnO or ITO thin film is coated by RF sputtering System.

CIGS Thin Film Solar Cell



SPECIFICATION

Deposition Thickness	Up to several 1000 A for Mo, CIGS, ZnO film
Film thickness uniformity	< ±5%
Film sheet resistance uniformity	< ±5% for Mo Film
Temperature uniformity	< ±3% on plate and Z-direction
Substrate Size	Glass and Flexible metal, 4inch~
Deposition	Mo film deposition by DC magnetron sputtering method
	CIGS film deposition by MBE
	Intrinsic and n type ZnO films by RF magnetron sputtering method
Vacuum chamber	6- Way Transfer chamber, LoadLock Chamber, MBE Chamber, Mo-ZnO sputtering Chamber

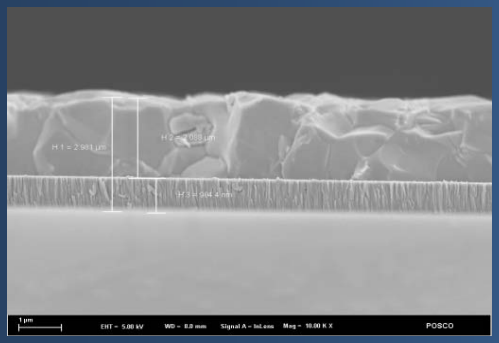
Silicon Thin Film Solar Cell System

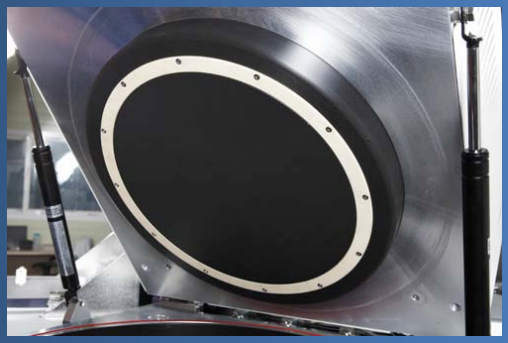
PE-CVD System is excellent alternative for depositing a variety of thin flms at lower temperature than those utilized in CVD reactors without setting for a lesser film quality. PE-CVD uses electrical energy to generate a glow Discharge(Plasma) in which the energy is transferred into a gas mixture. Some of the desirable properties of PE-CVD films are good adhesion, low pinhole density, good step coverage, and uniformity

Silicon Thin Film Solar Cell

SPECIFICATION

Sample Size	4inch ~
Power Source	RF 13.56MHz, VHF 60MHz
Deposition Type	PE-CVD, VHFCVD
Plasma Type	Direct Plasma
Substrate Temperature	Max. 450℃
Temperature Uniformity	< ±3%
High Vacuum Pumping	Rotary + TMP + Booster
Ultimate Pressure	5 x 10^{-6} Torr within 60min
Full Automation Control System Using PC Interface	





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